TOTAL AREA=11.27-3.05(POND#1)=8.22 AC.

FREQUENCY = 10 YEAR

1. VOLUME REQUIRED

		1) COMMERCIAL POND-2 8.22 AC.	1) COMMERCIAL POND-1 3.05AC.	2) OFF-SITE	3) RESIDENTIAL DIRECT DISCH	3) RESIDENTIAL THROU LINE: "A"	3) RESIDENTIAL THROU LINE: "F"
	C=	0.35	0.9	0.9	0.5	0.5	0.5
	I=	5.68	7.19	7.19	7.19	7.19	7.19
	A=	8.22	1.005	26.077	1.33	4.305	2.233
PRESENT	Q=	16.34	6.50	168.74	4.78	15.48	8.03
	C=	0.9	0.9	0.9	0.5	0.5	0.5
	I=	7.19	7.19	7.19	7.19	7.19	7.19
	A=	8.22	1.005	26.077	1.33	4.305	2.233
FUTURE	Q=	53.19	6.50	168.74	4.78	15.48	8.03
	C * A=	7.40	0.90	23.47	0.67	2.15	1.12

Q(TOTAL) = 219.87 CFS

TIME	INTN	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	T.DISCH	INFLOW	OUTFLOW	STORAGE
10	7.19	53.19	6.50	168.74	4.78	15.48	8.03	256.72	154,034.82	131,924.67	22,110.16
15	6.35	46.98	5.74	149.03	4.22	13.67	7.09	226.73	204,058.65	164,905.83	39,152.82
20	5.68	42.02	5.14	133.31	3.78	12.23	6.34	202.81	243,370.73	197,887.00	45,483.74
25	5.14	38.03	4.65	120.63	3.42	11.06	5.74	183.53	275,291.72	230,868.16	44,423.55
30	4.70	34.77	4.25	110.31	3.13	10.12	5.25	167.82	302,071.07	263,849.33	38,221.74
35	4.33	32.03	3.92	101.62	2.88	9.32	4.83	154.61	324,672.84	296,830.50	27,842.34
40	4.01	29.67	3.63	94.11	2.67	8.63	4.48	143.18	343,632.62	329,811.68	13,820.96
45	3.73	27.59	3.37	87.54	2.48	8.03	4.16	133.18	359,593.11	362,792.83	(3,199.72)
50	3.50	25.89	3.17	82.14	2.33	7.53	3.91	124.97	374,910.90	395,774.00	(20,863.10)
55	3.29	24.34	2.98	77.21	2.19	7.08	3.67	117.47	387,657.87	428,755.16	(41,097.29)
60	3.10	22.93	2.80	72.75	2.06	6.67	3.46	110.69	398,476.73	461,736.33	(63,259.60)
70	2.78	20.57	2.51	65.24	1.85	5.98	3.10	99.26	416,900.92	527,698.66	(110,797.74)
80	2.53	18.72	2.29	59.38	1.68	5.45	2.82	90.34	433,611.24	593,660.99	(160,049.76)
90	2.32	17.16	2.10	54.45	1.54	4.99	2.59	82.84	447,322.26	659,623.33	(212,301.06)

FREQUENCY = 25 YEAR

		1) COMMERCIAL POND-2 8.22 AC.	1) COMMERCIAL POND-1 3.05AC.	2) OFF-SITE	3) RESIDENTIAL DIRECT DISCH	3) RESIDENTIAL THROU LINE: "A"	3) RESIDENTIAL THROU LINE: "F"
	C=	0.35	0.9	0.9	0.5	0.5	0.5
	I=	6.61	8.22	8.22	8.22	8.22	8.22
	A=	8.22	1.005	26.077	1.33	4.305	2.233
PRESENT	Q=	19.02	7.43	192.92	5.47	17.69	9.18
	C=	0.9	0.9	0.9	0.5	0.5	0.5
	I=	8.22	8.22	8.22	8.22	8.22	8.22
	A=	8.22	1.005	26.077	1.33	4.305	2.233
FUTURE	Q=	60.81	7.43	192.92	5.47	17.69	9.18
	C * A=	7.40	0.90	23.47	0.67	2.15	1.12

Q(TOTAL) = 251.71 CFS

TIME	INTN	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	T.DISCH	INFLOW	OUTFLOW	STORAGE
10	8.22	60.81	7.43	192.92	5.47	17.69	9.18	293.50	176,101.01	151,024.25	25,076.75
15	7.33	54.23	6.63	172.03	4.87	15.78	8.18	261.72	235,551.16	188,780.31	46,770.85
20	6.61	48.90	5.98	155.13	4.40	14.23	7.38	236.02	283,218.41	226,536.38	56,682.03
25	6.01	44.46	5.44	141.05	4.00	12.94	6.71	214.59	321,887.79	264,292.44	57,595.35
30	5.50	40.69	4.97	129.08	3.66	11.84	6.14	196.38	353,487.42	302,048.50	51,438.92
35	5.07	37.51	4.59	118.99	3.37	10.91	5.66	181.03	380,159.65	339,804.57	40,355.09
40	4.69	34.70	4.24	110.07	3.12	10.10	5.24	167.46	401,904.48	377,560.63	24,343.86
45	4.37	32.33	3.95	102.56	2.91	9.41	4.88	156.03	421,292.73	415,316.69	5,976.04
50	4.08	30.18	3.69	95.75	2.71	8.78	4.56	145.68	437,038.99	453,072.75	(16,033.76)
55	3.83	28.33	3.46	89.89	2.55	8.24	4.28	136.75	451,285.61	490,828.82	(39,543.21)
60	3.60	26.63	3.26	84.49	2.39	7.75	4.02	128.54	462,747.17	528,584.88	(65,837.71)
70	3.21	23.75	2.90	75.34	2.13	6.91	3.58	114.82	481,385.60	604,097.01	(122,711.41)
80	2.90	21.45	2.62	68.06	1.93	6.24	3.24	103.55	497,024.74	679,609.13	(182,584.40)
90	2.64	19.53	2.39	61.96	1.76	5.68	2.95	94.26	509,021.88	755,121.26	(246,099.37)

FREQUENCY = 50 YEAR

		1) COMMERCIAL POND-2 8.22 AC.	1) COMMERCIAL POND-1 3.05AC.	2) OFF-SITE	3) RESIDENTIAL DIRECT DISCH	3) RESIDENTIAL THROU LINE: "A"	3) RESIDENTIAL THROU LINE: "F"
	C=	0.35	0.9	0.9	0.5	0.5	0.5
	I=	7.42	9.01	9.01	9.01	9.01	9.01
	A=	8.22	1.005	26.077	1.33	4.305	2.233
PRESENT	Q=	21.35	8.15	211.46	5.99	19.39	10.06
	C=	0.9	0.9	0.9	0.5	0.5	0.5
	I=	9.01	9.01	9.01	9.01	9.01	9.01
	A=	8.22	1.005	26.077	1.33	4.305	2.233
FUTURE	Q=	66.66	8.15	211.46	5.99	19.39	10.06
	C * A=	7.40	0.90	23.47	0.67	2.15	1.12

Q(TOTAL) = 276.40 CFS

TIME	INTN	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	T.DISCH	INFLOW	OUTFLOW	STORAGE
10	9.01	66.66	8.15	211.46	5.99	19.39	10.06	321.71	193,025.55	165,840.37	27,185.18
15	8.16	60.37	7.38	191.51	5.43	17.56	9.11	291.36	262,223.40	207,300.46	54,922.93
20	7.42	54.89	6.71	174.14	4.93	15.97	8.28	264.94	317,924.44	248,760.56	69,163.89
25	6.77	50.08	6.12	158.89	4.50	14.57	7.56	241.73	362,592.40	290,220.65	72,371.75
30	6.20	45.87	5.61	145.51	4.12	13.35	6.92	221.38	398,476.73	331,680.74	66,795.99
35	5.7	42.17	5.16	133.78	3.79	12.27	6.36	203.52	427,398.43	373,140.83	54,257.59
40	5.25	38.84	4.75	123.21	3.49	11.30	5.86	187.46	449,893.08	414,600.93	35,292.15
45	4.86	35.95	4.40	114.06	3.23	10.46	5.43	173.53	468,531.51	456,061.02	12,470.49
50	4.50	33.29	4.07	105.61	2.99	9.69	5.02	160.68	482,028.30	497,521.11	(15,492.81)
55	4.19	31.00	3.79	98.34	2.79	9.02	4.68	149.61	493,704.10	538,981.21	(45,277.11)
60	3.90	28.85	3.53	91.53	2.59	8.39	4.35	139.25	501,309.43	580,441.30	(79,131.87)
70	3.41	25.23	3.08	80.03	2.27	7.34	3.81	121.76	511,378.47	663,361.48	(151,983.02)
80	3.00	22.19	2.71	70.41	2.00	6.46	3.35	107.12	514,163.52	746,281.67	(232,118.15)
90	2.66	19.68	2.41	62.43	1.77	5.73	2.97	94.98	512,878.11	829,201.85	(316,323.74)

FREQUENCY = 100 YEAR

		1) COMMERCIAL POND-2 8.22 AC.	1) COMMERCIAL POND-1 3.05AC.	2) OFF-SITE	3) RESIDENTIAL DIRECT DISCH	3) RESIDENTIAL THROU LINE: "A"	3) RESIDENTIAL THROU LINE: "F"
	C=	0.35	0.9	0.9	0.5	0.5	0.5
	I=	8.3	9.8	9.8	9.8	9.8	9.8
	A=	8.22	1.005	26.077	1.33*	4.305**	2.233***
PRESENT	Q=	23.88	8.86	230.00	6.52	21.09	10.94
	C=	0.9	0.9	0.9	0.5	0.5	0.5
	I=	9.8	9.8	9.8	9.8	9.8	9.8
	A=	8.22	1.005	26.077	1.33	4.305	2.233
FUTURE	Q=	72.50	8.86	230.00	6.52	21.09	10.94
	C * A=	7.40	0.90	23.47	0.67	2.15	1.12

* = AREA 46
** = AREA 4,20,21,22,39
*** = AREA 25,26,27,28

Q(TOTAL) = 301.30 CFS

TIME	INTN	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	Q=(CA)*I	T.DISCH	INFLOW	OUTFLOW	STORAGE
10	9.80	72.50	8.86	230.00	6.52	21.09	10.94	349.92	209,950.10	180,777.32	29,172.78
15	9.00	66.58	8.14	211.22	5.99	19.37	10.05	321.35	289,216.98	225,971.66	63,245.33
20	8.30	61.40	7.51	194.80	5.52	17.87	9.27	296.36	355,629.77	271,165.99	84,463.78
25	7.50	55.49	6.78	176.02	4.99	16.14	8.37	267.79	401,690.25	316,360.32	85,329.93
30	7.10	51.05	6.24	161.94	4.59	14.85	7.70	246.37	443,466.04	361,554.65	81,911.39
35	6.40	47.35	5.79	150.20	4.26	13.78	7.15	228.52	479,885.95	406,748.98	73,136.97
40	5.90	42.91	5.25	136.12	3.86	12.48	6.48	207.09	497,024.74	451,943.31	45,081.43
45	5.40	39.95	4.88	126.73	3.59	11.62	6.03	192.81	520,590.56	497,137.64	23,452.92
50	5.00	36.99	4.52	117.35	3.33	10.76	5.58	178.53	535,587.00	542,331.97	(6,744.97)
55	4.80	35.51	4.34	112.65	3.19	10.33	5.36	171.39	565,579.87	587,526.30	(21,946.43)
60	4.50	33.29	4.07	105.61	2.99	9.69	5.02	160.68	578,433.96	632,720.63	(54,286.67)
70	4.00	29.59	3.62	93.88	2.66	8.61	4.47	142.82	599,857.44	723,109.30	(123,251.86)
80	3.70	27.37	3.35	86.84	2.46	7.96	4.13	132.11	634,135.01	813,497.96	(179,362.95)
90	3.40	25.15	3.08	79.80	2.26	7.32	3.80	121.40	655,558.49	903,886.62	(248,328.13)

2. VOLUME PROVIDED

ELEV	AREA	AVE. AREA	VOLUME	CUM. VOL.	
524	21,641.17	20,292.64	20,292.64	85,625.93	
523	18,944.11	17,674.21	17,674.21	65,333.29	
522	16,404.31	15,213.06	15,213.06	47,659.08	
521	14,021.81	12,909.24	12,909.24	32,446.02	
520	11,796.65	10,762.82	10,762.82	19,536.79	
519	9,728.97	8,773.97	8,773.97	8,773.97	
518	7,818.97				

3. ALLOWABLE DISCHARGE

10 YEAR: – TOTAL DISCHARGE = 219.87 CFS

25 YEAR: – TOTAL DISCHARGE = 251.71 CFS

50 YEAR: – TOTAL DISCHARGE = 276.40 CFS

100 YEAR: – TOTAL DISCHARGE = 301.30 CFS

4. WATER SURFACE ELEVATION

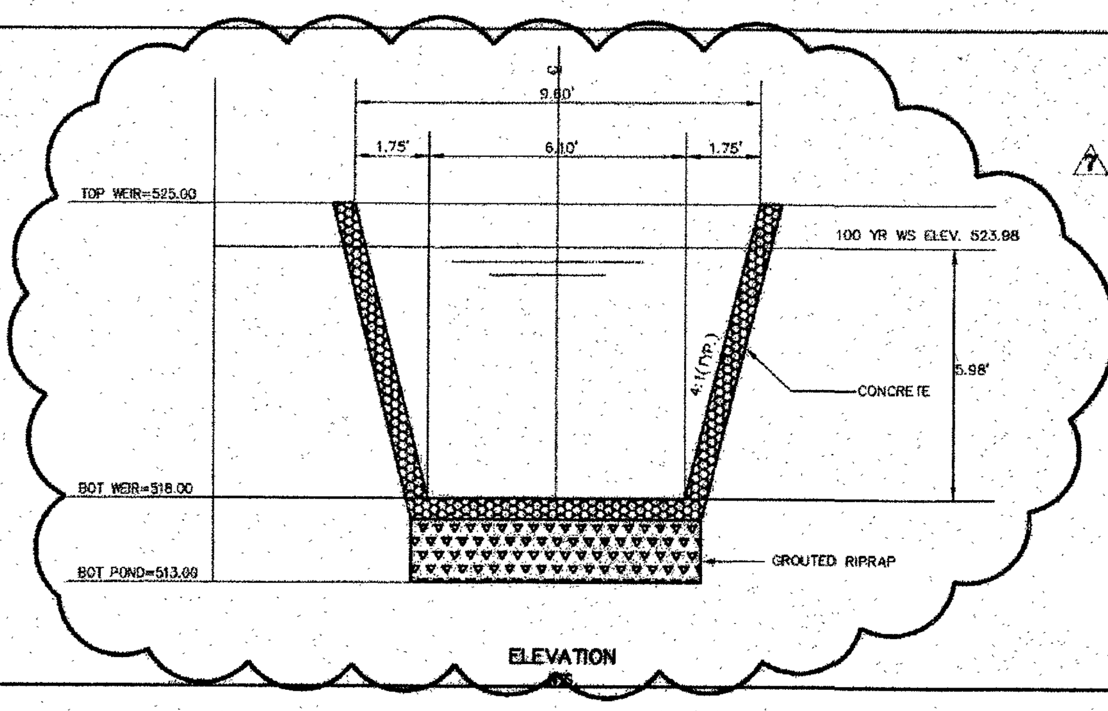
10 YEAR:
47,659.08 – 32,446.02 CF = 522.00' –521.00'
=15,213.06 CF = 1.00'
=45,483.74 –32,446.02 = 13,037.72 CF = 0.86'
W.S ELEV = 521.86

25 YEAR:
65,333.29 – 47,659.08 CF = 523.00' –522.00'
=17,674.21 CF = 1.00'
=57,595.35 –47,659.08 = 9,936.27 CF = 0.56'
W.S ELEV = 522.56

50 YEAR:
85,625.93 – 65,333.29 CF = 524.00' –523.00'
=20,292.64 CF = 1.00'
=72,371.75 –65,333.29 = 7,038.46 CF = 0.35'
W.S ELEV = 523.35

100 YEAR:
85,625.93 – 65,333.29 CF = 524.00' –523.00'
=20,292.64 CF = 1.00'
=85,329.93 –65,333.29 = 19,996.64 CF = 0.98'
W.S ELEV = 523.98

TRAPEZOIDAL WEIR CALCULATIONS
$Q = 3.367*(b)*(H)^{3/2}$
Q = DISCHARGE
H = HEAD ON WEIR = W.S ELEV. – F.L ELEV
b = BOTTOM WIDTH



ELEVATION

5. ACTUAL DISCHARGE

10 YEAR:
H = TOTAL HEAD = 521.86 – 518.00 = 3.86
Q = 3.367 * 6.1 * 3.86^1.5 = 155.76 CFS

25 YEAR:
H = TOTAL HEAD = 522.56 – 518.00 = 4.56
Q = 3.367 * 6.1 * 4.56^1.5 = 200.00 CFS

50 YEAR:
H = TOTAL HEAD = 523.35 – 518.00 = 5.35
Q = 3.367 * 6.1 * 5.35^1.5 = 254.16 CFS

100 YEAR:
H = TOTAL HEAD = 523.98 – 518.00 = 5.98
Q = 3.367 * 6.1 * 5.98^1.5 = 300.35 CFS

REVISED TO CONFORM TO CONSTRUCTION RECORDS.
DATE: 10/27/06

DETENTION POND # 2 (8.22 AC CAPACITY)
FLAGSTONE ESTATES
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

4 01-31-06
7 CHANGE DET-ENTION POND
REVISION

K.E.B.
CHECKED

D.L.B.
DRAWN

9/04
DATE

0114 32B DETENTION
PROJECT

32B
OF

DOUPHRATE & ASSOCIATES, INC.
ENGINEERING • PROJECT MANAGEMENT • SURVEYING
2235 RIDGE RD., # 200 ROCKWALL, TEXAS 75087
PHONE: (972)771-9004 FAX: (972)771-9005

HOMEYER ENGINEERING, INC.
TBPE FIRM REGISTRATION NO. F-8440
P.O. BOX 294527 • LEWISVILLE • TEXAS • 75029
972-906-9985 PHONE • 972-906-9987 FAX
WWW.HEI.US.COM

ROCK RIDGE ASSISTED LIVING
AND MEMORY CARE
LOT 1R, BLOCK A,
FLAGSTONE CORNERS
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

DOUPHRATE & ASSOCIATES
DETENTION POND #2

DRAWN: SRH

DATE: 11/27/12

HEI #: 12-112

SHEET NO:
C10.1

* * FOR REFERENCE PURPOSES ONLY * *